

APPENDIX E
MIST NETTING SURVEY REPORT

**Mist Netting Survey for the Federally Endangered
Indiana Bat (*Myotis sodalis*) along the Proposed General
Motors-Memphis Junction 161 kV Transmission Line
Warren County, KY**

Prepared for:

U.S. Fish and Wildlife Service
Kentucky Field Office
Frankfort, KY

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INTRODUCTION

In April 2008, Warren Rural Electric Cooperative Corporation (RECC), located in Bowling Green, KY, will join East Kentucky Power Cooperative (EKPC) as a member electric distribution cooperative. Warren RECC currently receives its electricity from Tennessee Valley Authority (TVA) and is not connected to the EKPC power grid. Therefore, transmission lines must be constructed and rebuilt to tie Warren RECC into the power grid and allow them to receive electricity from EKPC.

One of these transmission lines is a proposed 161 kilovolt (kV) transmission line in Warren County, KY (Figure 1). The line begins at the East Bowling Green/General Motors substation northeast of Bowling Green and ends at the Memphis Junction substation, located southwest of Memphis Junction. The proposed transmission line would cross the Bristow, Bowling Green North, Bowling Green South, and Rockfield USGS 7.5 minute topographic quadrangles.

Because the proposed transmission project will require the clearing of some trees, the Indiana Bat Revised Recovery Plan (USFWS 1999) (Appendix IV) requires that a mist netting survey be conducted for the endangered Indiana bat (*Myotis sodalis*). The clearing of trees during the summer months raises questions and concerns for the welfare of the Indiana bat and its summer habitat. In accordance with United States Fish and Wildlife Service (USFWS) guidelines, a mist-netting proposal was prepared and submitted to the Frankfort Field Office on 11 July 2005. The USFWS reviewed this proposal, and in an email dated 1 August 2005, stated that the survey plan was adequate to determine presence or probable absences of the Indiana Bat within the proposed project area. A copy of this proposal can be found in Appendix V.

After receiving concurrence on the mist-netting proposal from USFWS, EKPC conducted a mist-netting survey according to the Indiana Bat Revised Recovery Plan (USFWS 1999), to determine the presence or probable absence of the Indiana bat along the proposed corridor.

SPECIES STATUS

Distribution

Miller and Allen (1928) described a new species to science, the Indiana bat (*Myotis sodalis*), in 1928, and this species formally attained endangered species status March 11, 1967. Its distribution is in the eastern United States, from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida (Barbour and Davis 1969). In Kentucky, the Indiana bat's wintering distribution is fairly well documented and includes several caves throughout the karst regions of the state (Palmer-Ball et al. 1988). Kentucky contains three Priority One hibernacula (Priority One hibernacula are hibernation sites with a recorded population >30,000 bats since 1960) and houses a significant portion of the total population of Indiana bats (USFWS 1999).

For the proposed project, the closest known hibernacula are located in Warren and Barren Counties. In Warren County, a cave in the Bowling Green North Quadrangle and another in the Smiths Grove Quadrangle have historically contained small numbers of hibernating Indiana bats. The Barren County record is from Indian Cave along KY 70 near Mammoth Cave National Park. This cave once had about two-dozen Indiana bats hibernating in it and has been gated, but since then no bats have been found using the cave. Neither of these caves will be affected by the proposed transmission line.

Life History

Indiana bats use caves and abandoned mine portals as hibernacula. After hibernation, females leave the hibernacula and typically fly north and northwest to nursery sites to raise their young. Although some males may leave with the females, others stay near or in the hibernacula throughout the summer months (Barbour and Davis 1969). After leaving the hibernacula, Indiana bats are known to roost under the exfoliating bark of dead and live trees (MacGregor et al. 1999), and they have been documented using tree cavities as well (Garner et al. 1991).

It has also been shown that Indiana bats exhibit fidelity for summer roost trees (Garner and Gardner 1992). Early studies indicated that floodplain forests were the significant habitat for Indiana bats (Humphrey et al. 1977), but recent studies indicate that this species uses both upland and riparian habitats (MacGregor et al. 1999, Garner et al. 1991). Most known maternity roosts have been located in wooded areas with a semi-open canopy or along forest edges. Maternity colonies are initially composed of 50-100 females, each of which bears one young in May or June. Maternity colonies typically roost under the exfoliating bark of dead or live trees, but they have also been found to use cavities as temporary roosts (Callahan 1993, Garner et al. 1991).

The closest maternity roost record to the project area is located in Edmonson County, in the proximity of Mammoth Cave National Park, approximately 23 km from the nearest point of the proposed corridor. A maternity roost is also documented for Logan County, but it is attributed to a single juvenile male that was caught there during the maternity season. Indiana bats have also been recorded in Warren County, as well as the adjacent counties of Barren, Allen, and Hart. The summer distribution of this species in Kentucky is not well known, but expanded mist netting efforts by numerous biologists are increasing this knowledge base.

PROJECT DESCRIPTION AND LOCATION

The proposed transmission line would be located in Warren County, KY and would be approximately 24.5 km (15.21 miles) in length (Figure 1). Construction of the new line would involve the rebuilding of a 8.3 km (5.17 mile) section of existing double circuit 69 kV transmission line and a 5.5 km (3.39 mile) section of existing single circuit 69 kV transmission line, both supported by single wood pole structures on existing 100 ft wide rights-of-way (ROWS). The existing lines within these two sections would be dismantled

and replaced by the proposed new transmission line. The proposed new line would be located on the existing 100 ft wide ROWs within these two sections and would not require any additional ROW width. The balance of the proposed new line would be new construction, 3.9 km (2.41 miles) of which would require a new 100 ft wide ROW and would parallel an existing electric transmission line, and 6.8 km (4.24 miles) of which would require a new 100 foot wide ROW, 50 feet of which would be shared with another proposed new electric transmission line. The ROW for the proposed transmission line would encompass approximately 184.4 acres of land, of which 118.4 acres would utilize existing ROWs.

The proposed line would begin at the East Bowling Green/ General Motors Substation northeast of Bowling Green and travel west along the northern edge of the city (Figure1). It would then turn southwest after the third Barren River crossing and extend to just east of Blue Level. At this point, the line would travel south and end at the Memphis Junction Substation, located southwest of Memphis Junction.

The project area lies in the Mississippian Plateaus region in south-central Kentucky, and is characterized by gently rolling hills, sinkholes and isolated knobs (McGrain and Currens 1978). The forest in this area is primarily made up of second and third-growth oak-hickory forest, with shagbark hickory (*Carya ovata*), white oak (*Quercus alba*), southern red oak (*Quercus falcata*), sugar maple (*Acer saccharum*), and tulip poplar (*Liriodendron tulipifera*) as the dominant species.

For the proposed project, approximately 3.3 km (2.1 miles) contains forested area. These forested areas consist of small patches of woods on ridge tops or along the Barren River and its tributaries. The upland forests are typical of second and third-growth oak-hickory forests and the riparian zones contain species commonly present in bottomland hardwood forests. Common tree species in the riparian areas are sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), hackberry (*Celtis occidentalis*), and silver maple (*Acer saccharinum*). The rest of the proposed corridor is primarily used for agricultural, residential, and commercial purposes.

Because the proposed corridor extends through forested areas, the cutting of trees and other vegetation will be required. EKPC has determined that clearing would be required on approximately 17 percent of the proposed route for the new electric line. The proposed ROW would be cut through a combination of manual and mechanical means, and would be maintained through a combination of manual and mechanical cutting along with the ground application of approved herbicides.

The new transmission line would be supported by 195 single, H-frame double, and H-frame triple Corten tubular steel pole structures that would range in height from 95 to 100 feet aboveground. The average span between support structures would be 600 feet. The proposed new transmission line would be constructed to double circuit specifications but would be operated as a single circuit line until the electric load in the area warrants operation of the second circuit. Access for the construction of the proposed transmission

line would maximize the use of existing public and private roads in the project area. Some temporary roads would be required for construction of the proposed line.

METHODS

Sampling for bats took place on 18, 20, and 21 July 2005 and was conducted by EKPC biologists Joe Settles, Josh Young, Seth Bishop, and Missy Toncray, and private contractors Jill Baldwin and Rhonda Smith. The two net sites that were surveyed were the same mist net sites that were selected in the mist-netting proposal submitted to USFWS. In accordance with the mist-netting guidelines listed in the Indiana Bat Revised Recovery Plan (USFWS 1999), sampling at each site consisted of a minimum of two net locations, which were tended from dusk until five hours after sunset.

Both net sites were located either on streams or along riparian zones. Net Site 1 was located on Jennings Creek east of the KY 2665 bridge (Figure 2). The creek at this point was approximately 30-40 ft wide and was bordered on both sides by riparian zones consisting primarily of sycamore (*Platanus occidentalis*) and box elder (*Acer negundo*). At points where these trees provided good canopy closure over the creek, two 30 ft mist nets were erected. This site was located on the Bowling Green North USGS 7.5 minute topographic quadrangle, with a GPS location of 36.99995 N – 86.48525 W.

Net Site 2 was located north of US 31W near the KY 3225 junction, on a private road running parallel to the south side of the Barren River (Figure 2). The road was wooded and ranged from 20-30 ft wide. A 20 ft and a 30 ft mist net were each placed along the road in areas where good canopy coverage was provided by such tree species as sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), and hackberry (*Celtis occidentalis*). This site was also located on the Bowling Green North USGS 7.5 minute topographic quadrangle, with a GPS location of 37.01281 N – 86.41054 W.

Data recorded for bats caught included species, sex, age (adult or juvenile), reproductive condition, forearm length, and weight. Captured bats were banded with numbered aluminum bands (provided by the Kentucky Department of Fish and Wildlife Resources) and released at the capture site.

RESULTS

During the mist netting survey, 32 bats were captured consisting of four species: the red bat (*Lasiurus borealis*), big brown bat (*Eptesicus fuscus*), gray bat (*Myotis grisescens*), and eastern pipistrelle (*Pipistrellus subflavus*) (Table 1). Of the 32 total bats captured, there were 5 red bats, 18 big brown bats, 6 gray bats, and 3 eastern pipistrelles (Table 1). Both sites had equal species diversity with 3 species each (Table 1). The greatest number of bats was recorded at Site 2, with 24 total individuals captured on 20 and 21 July (Table 1).

Of the six gray bats that were captured at Net Site 1, four were adults, including a post-lactating female (Appendix 1). The other adult bats were all males, two of which were in

breeding condition with testes descended. A juvenile female was also caught at Net Site 1.

DISCUSSION

The results of this mist netting survey show that no Indiana bats were captured, indicating absence of the species in the vicinity of the proposed powerline corridor. Therefore, the proposed powerline corridor should not adversely affect the Indiana bat or its summer habitat.

Although no Indiana bats were captured during the mist-netting survey, six federally endangered gray bats were captured at Net Site 1. Gray bats are locally abundant in this area of Kentucky and are known to roost in caves year-round (Barbour and Davis 1974). Since one of these bats was a post-lactating female and another was a juvenile female, a maternity cave may be present in the area. However, the project corridor was surveyed for the presence of caves or sinkholes that may serve as roosting habitat for this species. Although the project area is a well-documented karst region, no caves or sinkholes are located in the proposed powerline. A few sinkholes were encountered near the proposed powerline, but all were either filled in by soil and other debris or did not show any signs of bat activity. Some landowners were also questioned concerning the possibility of caves in the area, and none of the landowners knew of any caves within the project corridor. Therefore, gray bats should not be adversely affected by the proposed project.

DETERMINATION OF EFFECTS ON THE INDIANA BAT

- ☐ No effect
- ☒ Not likely to adversely affect
- ☐ Likely to adversely affect

DETERMINATION OF EFFECTS ON THE GRAY BAT

- ☐ No effect
- ☒ Not likely to adversely affect
- ☐ Likely to adversely affect

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- U.S. Fish and Wildlife Service. 1999. Agency Draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. Fort Snelling, ME. pp. 1-53.

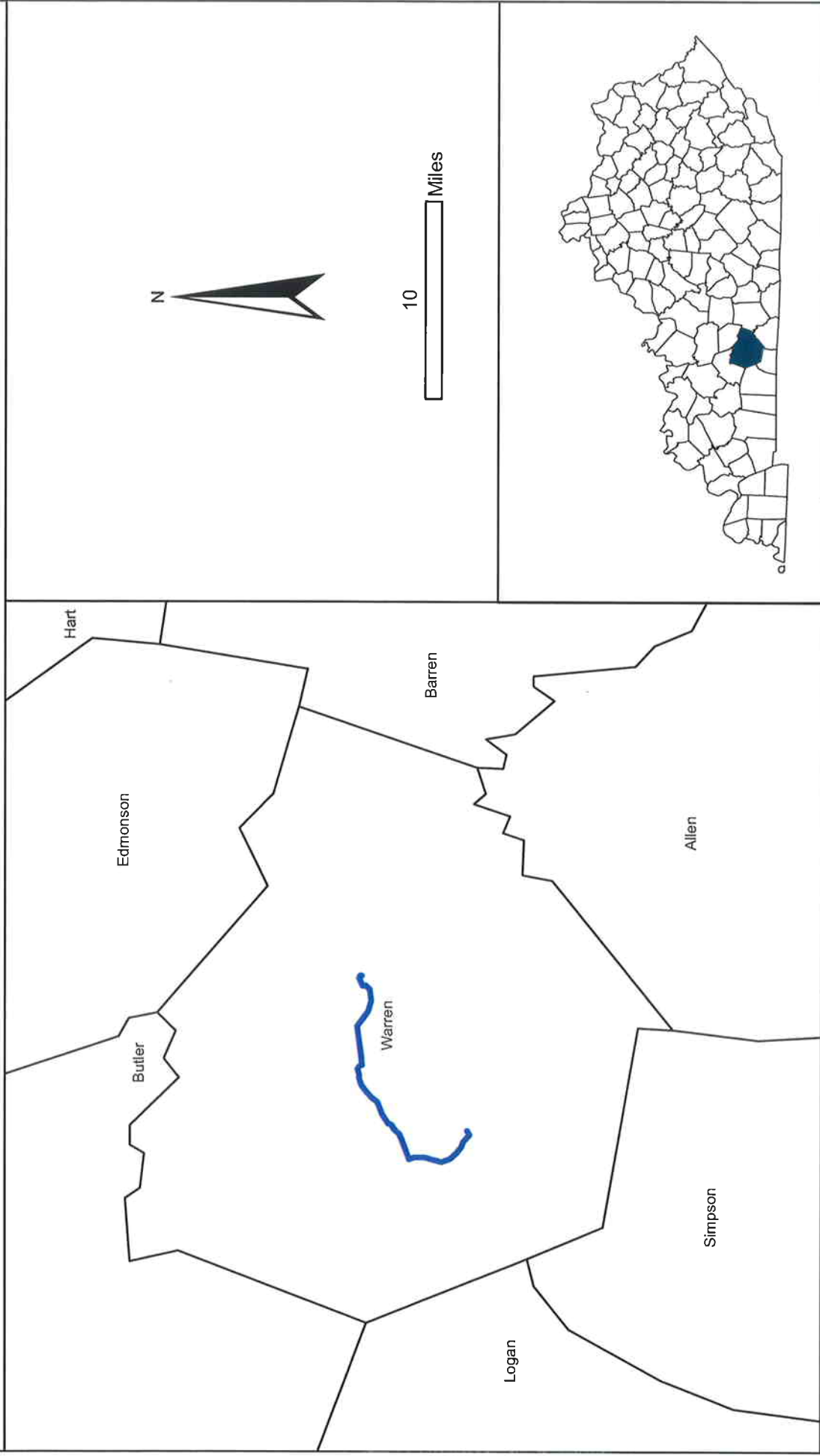
Table 1. Total bats captured at each net site by species during mist netting for EKPC's proposed General Motors-Memphis Junction transmission line project between 18 July and 21 July 2005

	Site 1	Site 2	Total Captures/Sp.
<i>Lasiurus borealis</i>	1	4	5
<i>Eptesicus fuscus</i>	0	18	18
<i>Myotis grisescens</i>	6	0	6
<i>Pipistrellus subflavus</i>	1	2	3
Total Captures/Net Site	8	24	32

FIGURES LEGEND

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Figure 1. Location for the General Motors-Memphis Junction transmission line, Warren County, KY




<p>Proposed Transmission Line Route</p>	<p>GM - Memphis Jct Proposed 161kV Transmission Line Warren County, KY Project No. 21392</p>	 <p>EAST KENTUCKY POWER COOPERATIVE P.O. Box 707 Winchester, KY 40392-0707</p>
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Figure 2. Proposed route for the General Motors-Memphis Junction transmission line, Warren County, KY

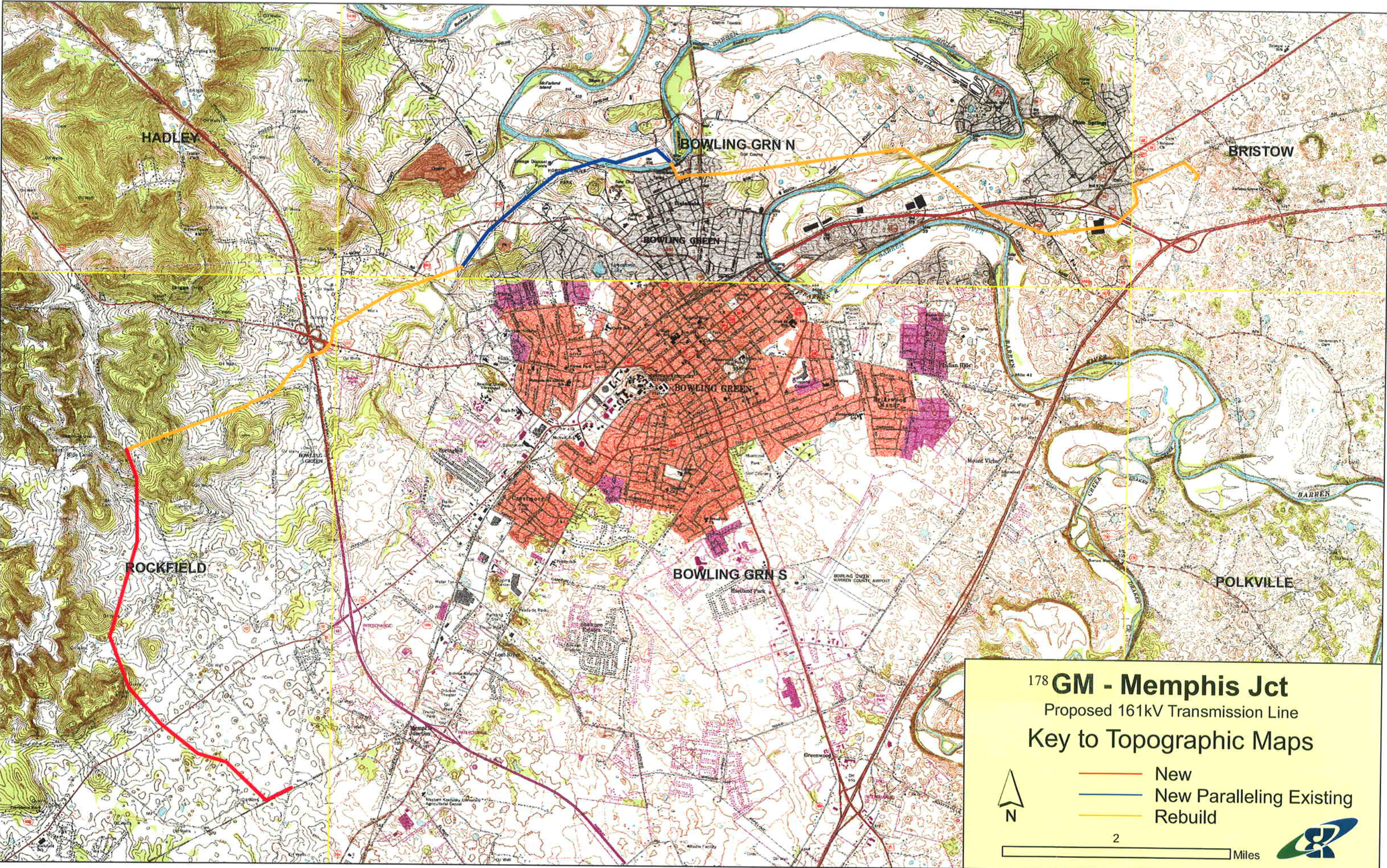
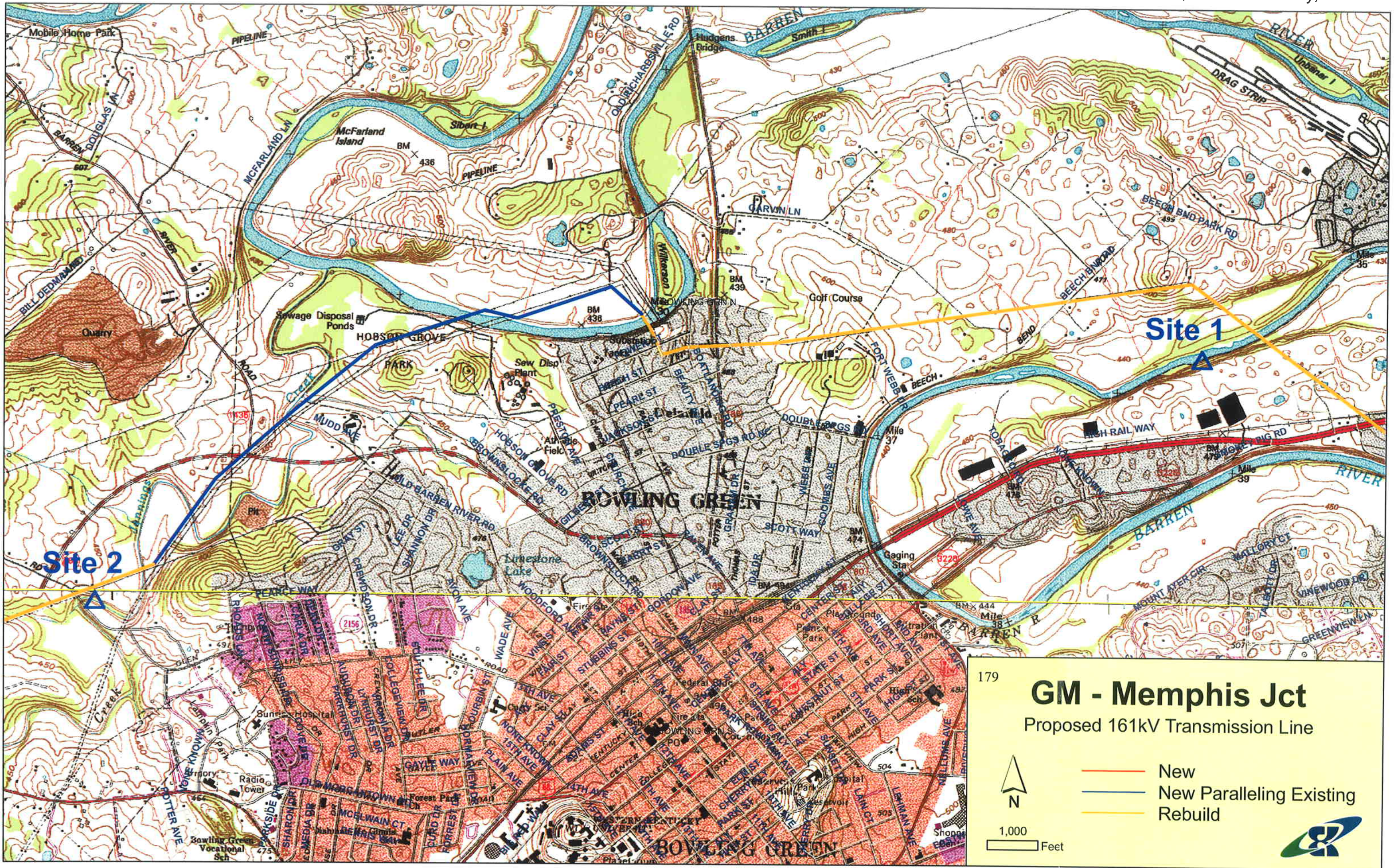


Figure 3. Mist net sites surveyed between 18 July and 21 July 2005 for the proposed General Motors-Memphis Junction transmission line, Warren County, KY



APPENDIX I. BATS CAPTURED DURING MIST NETTING SURVEY



Site	Date	Time	Species	Reproductive Cond	Age	Sex	Weight (g)	Forearm (mm)	Net	Band No KY F&W	Notes
GM-Memphis Jct. 1	7/18/05	00:35	<i>Myotis grisescens</i>	PL	A	F	11.1	43	A	A11828	
GM-Memphis Jct. 1	7/21/05	22:15	<i>Lasiurus borealis</i>	NR	J	F	9.8	42	A	A11602	
GM-Memphis Jct. 1	7/21/05	23:10	<i>Myotis grisescens</i>	TD	A	M	10.8	44	B	A11607	
GM-Memphis Jct. 1	7/21/05	00:00	<i>Myotis grisescens</i>	NR	A	M	10.8	43	A	A11634	
GM-Memphis Jct. 1	7/21/05	00:58	<i>Myotis grisescens</i>	NR	J	F	10.0	43	A	A11612	
GM-Memphis Jct. 1	7/21/05	01:55	<i>Myotis grisescens</i>	NR	A	M	10.4	43	B	A11626	
GM-Memphis Jct. 1	7/21/05	01:55	<i>Myotis grisescens</i>	TD	A	M	10.4	43	B	A11633	
GM-Memphis Jct. 1	7/21/05	02:05	<i>Pipistrellus subflavus</i>	NR	J	M	5.1	34	A	No Band	Too small for banding
GM-Memphis Jct. 2	7/20/05	21:17	<i>Lasiurus borealis</i>	-	-	-	-	-	A	No Band	Got out of net
GM-Memphis Jct. 2	7/20/05	21:35	<i>Lasiurus borealis</i>	PL	A	F	13.6	41	A	A11786	
GM-Memphis Jct. 2	7/20/05	21:35	<i>Eptesicus fuscus</i>	PL	A	F	18.5	47	A	A11776	
GM-Memphis Jct. 2	7/20/05	22:20	<i>Eptesicus fuscus</i>	NR	A	F	23.0	49	A	A11763	
GM-Memphis Jct. 2	7/20/05	22:20	<i>Eptesicus fuscus</i>	NR	A	M	17.0	47	A	A11754	
GM-Memphis Jct. 2	7/20/05	22:20	<i>Eptesicus fuscus</i>	PL	A	F	20.5	46	A	A11767	
GM-Memphis Jct. 2	7/20/05	22:20	<i>Eptesicus fuscus</i>	NR	A	F	19.5	48	A	A11756	
GM-Memphis Jct. 2	7/20/05	22:30	<i>Eptesicus fuscus</i>	NR	J	F	15.0	46	A	A11783	
GM-Memphis Jct. 2	7/20/05	22:35	<i>Eptesicus fuscus</i>	-	-	-	-	-	-	A11763	Recapture
GM-Memphis Jct. 2	7/20/05	22:50	<i>Lasiurus borealis</i>	NR	J	F	12.5	42	A	A11757	
GM-Memphis Jct. 2	7/20/05	22:56	<i>Eptesicus fuscus</i>	NR	A	M	17.7	46	A	A11774	
GM-Memphis Jct. 2	7/20/05	22:56	<i>Eptesicus fuscus</i>	NR	J	F	21	48	A	A11840	
GM-Memphis Jct. 2	7/20/05	22:56	<i>Eptesicus fuscus</i>	NR	J	F	13.3	44	A	A11830	
GM-Memphis Jct. 2	7/20/05	23:10	<i>Lasiurus borealis</i>	-	-	-	-	-	A	No Band	Got out of net
GM-Memphis Jct. 2	7/20/05	00:05	<i>Eptesicus fuscus</i>	NR	J	F	17.5	49	A	A11794	
GM-Memphis Jct. 2	7/21/05	21:25	<i>Pipistrellus subflavus</i>	NR	J	M	4.0	33	A	A11138	
GM-Memphis Jct. 2	7/21/05	22:20	<i>Eptesicus fuscus</i>	PL	A	F	22.7	47	B	A11149	
GM-Memphis Jct. 2	7/21/05	22:20	<i>Eptesicus fuscus</i>	-	-	-	-	-	B	No Band	Got out of net



Site	Date	Time	Species	Reproductive Cond	Age	Sex	Weight (g)	Forearm (mm)	Net	Band No KY F&W	Notes
GM-Memphis Jct. 2	7/21/05	23:10	<i>Eptesicus fuscus</i>	PL	A	F	18.6	44	B	A11126	
GM-Memphis Jct. 2	7/21/05	23:19	<i>Eptesicus fuscus</i>	NR	J	F	15.5	45	A	A11101	
GM-Memphis Jct. 2	7/21/05	23:35	<i>Eptesicus fuscus</i>	PL	A	F	17.5	45	B	A11129	
GM-Memphis Jct. 2	7/21/05	00:00	<i>Eptesicus fuscus</i>	NR	J	M	16.5	46	A	A11102	
GM-Memphis Jct. 2	7/21/05	00:30	<i>Eptesicus fuscus</i>	-	-	-	-	-	B	A11101	
GM-Memphis Jct. 2	7/21/05	00:30	<i>Pipistrellus subflavus</i>	NR	J	M	5.1	31	B	A11130	
GM-Memphis Jct. 2	7/21/05	01:15	<i>Eptesicus fuscus</i>	PL	A	F	20.9	47	B	A11115	
GM-Memphis Jct. 2	7/21/05	02:00	<i>Eptesicus fuscus</i>	PL	A	F	18.9	49	B	A11122	

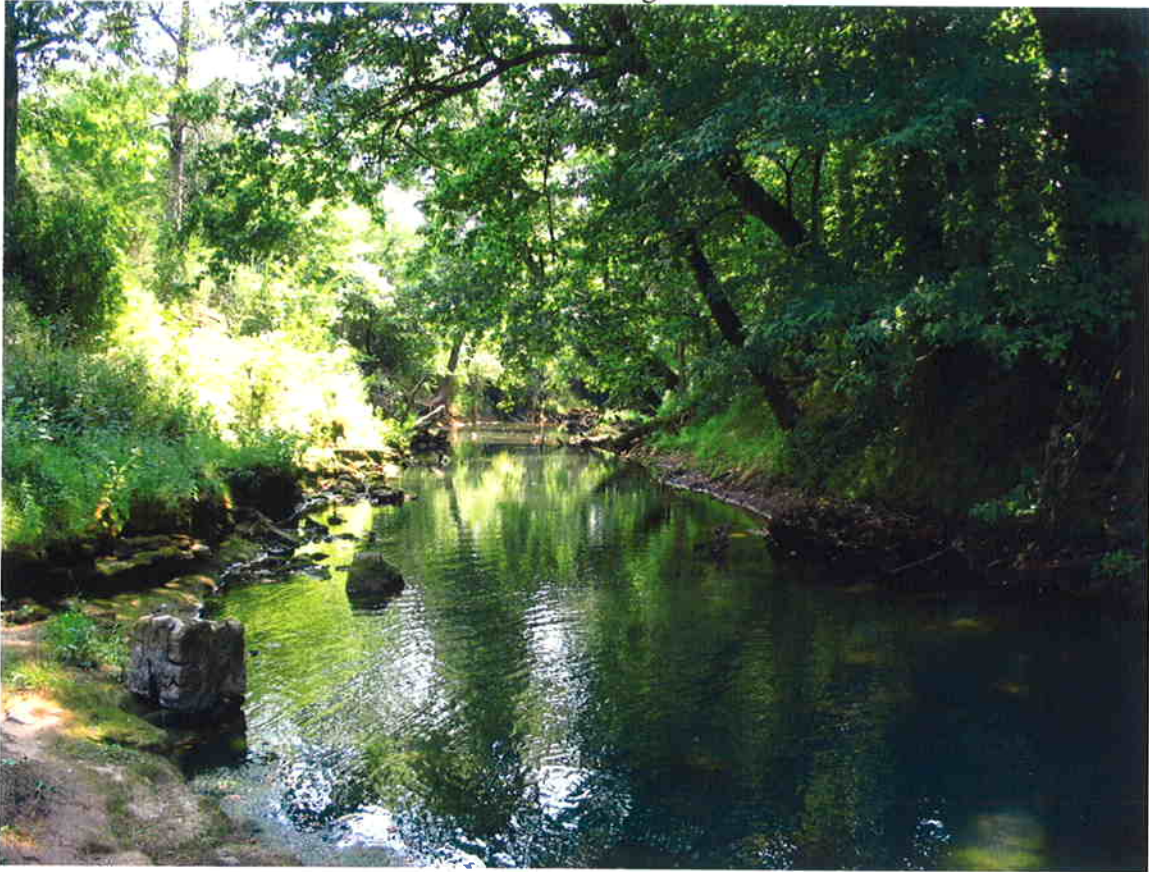
A = Adult
J = Juvenile
F = Female
M = Male

L = Lactating
PL = Post Lactating
P = Pregnant
S = Scrotal

NR = Non-reproductive
U = Unknown

APPENDIX II. PHOTOGRAPHS OF NET SITES

Net Site 1. Jennings Creek east of KY 2665 bridge



Nets A and B on same stream corridor

Net Site 2. Private road running parallel to the south side of the Barren River, north of US 31W near the KY 3225 junction



Net A



Net B

APPENDIX III. MIST NETTING DATA SHEETS

East Kentucky Power Mist Netting Data Sheet

21A

Date: 7-18-05 Project: GM - Memphis Jet County: Warren Quad: B6 North
 Location: Glen Lily Rd (26665) + Jennings Creek Anabat #: _____
 Start Time: 9:00 Start Temp: 85 End Time: 2:00 End Temp: 70°
 Weather: Clear + humid Wind: — Personnel: RS, MCT

Provide sketch of net site on reverse side; include net location and number, water sources, roads, trails, bridges, mines/caves, local landscape features, and vegetative description.

#	Time (EST)	Species	Sex/Repro	Age	Weight (g)	Forearm (mm)	Net/Height (ft)	Band # Type:	Transmitter Frequency
1	1235	<i>M. grisescens</i>	F/PL	A	11.1	43	A/12	A11822	
2									
3									
4									
5									
6									
7									
8									
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34									
35									

Site Description: GPS #1 GM-MJNS message: Jennings Creek
 36.99995 N 86.48525 W

* take photos

East Kentucky Power Mist Netting Data Sheet

21/8

Date: 7/21/05 Project: GM-Memphis St County: Warren Quad: Bowling Green Sect A/A
 Location: Jennings Creek approx. 0.5m downstream of Glen Lily Rd.
 Start Time: 9:00 Start Temp: 80.0°F End Time: 2:00 End Temp: 74.5
 Weather: Hot, Humid, Clear Wind: calm Personnel: IRY, JES

Provide sketch of net site on reverse side; include net location and number, water sources, roads, trails, bridges, mines/caves, local landscape features, and vegetative description.

#	Time (EST)	Species	Sex/Repro	Age	Weight (g)	Forearm (mm)	Net/Height (ft)	Band # Type: <u>XY:4W</u>	Transmitter Frequency
1	10:15	<i>L. borealis</i>	F	YOY	9.8	42	A/4'	A11602	
2	11:00	<i>M. grisescens</i>	M/AD	A	10.4	44	B/12'	A11607	
3	12:00	<i>M. grisescens</i>	M	A	10.8	43	A-14'	A11634	
4	12:58	<i>M. grisescens</i>	F	YOY	10.0	43	A-13'	A11612	
5	1:55	<i>M. gris.</i>	M	A	10.4	43	B/15	A11626	
6	1:55	<i>M. gris.</i>	M/AD	A	10.4	43	B/15	A11633	
7	2:05	<i>Pip. sub.</i>	M	YOY	5.1	34	A/12	No Band	
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9									
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35									

Site Description: Nets over stream corridor with good canopy closure
Stream corridor is buffered by approx. 20ft riparian zone - on
either side is open pasture

East Kentucky Power Mist Netting Data Sheet

2A

Date: 7-20-05 Project: GM - Memphis Junction County: Warren Quad: Bowling Green W

Location: Barren River - Private property off 31W Anabat #: _____

Start Time: 9:00 pm Start Temp: 85° End Time: 2:00 am End Temp: _____

Weather: Clear and humid Wind: 2-5 mph Personnel: MCT, JNB

Provide sketch of net site on reverse side; include net location and number, water sources, roads, trails, bridges, mines/caves, local landscape features, and vegetative description.

#	Time (EST)	Species	Sex/Repro	Age	Weight (g)	Forearm (mm)	Net/Height (ft)	Band # Type: _____	Transmitter Frequency
1	9:17	<i>L. borealis</i>	GOT	out	OF	NET	A/12		
2	9:35	<i>L. borealis</i>	F/postlar	A	13.6	41	A/6	A11786	
3	9:42	<i>E. fus</i>	F/postlar	A	18.5	47	A/4	A11796	
4	9:50	<i>E. fus</i>	F/immature	A	23	49	A/7	A11763	
5	10:20	<i>E. fus</i>	M	A	17	47	A/10	A11754	
6	10:30	<i>E. fus</i>	F/postlar	A	20.5	46	A/5	A11767	
7	10:35	<i>E. fus</i>	F/immature	A	10.5	48	A/10	A11756	
8	10:35	<i>E. fus</i>	F/immature	10Y	15	46	A/12	A11782	
9	10:35	<i>E. fus</i>	F/immature	10Y	15	46	A	A11743	
10	10:50	<i>L. borealis</i>	F/immature	10Y	12.5	42	A/15	A11757	
11	10:55	<i>E. fus</i>	F	A	17.7	46	A/10	A11794	
12	10:55	<i>E. fus</i>	F	10Y	21	47	A/15	A. 840	
13	10:55	<i>E. fus</i>	F/immature	10Y	13.3	47	A/15	A11730	
14	11:10	<i>L. borealis</i>	GOT	out	OF	NET	A/10		
15	11:15	<i>E. fus</i>	F	10Y	21	47	A/16	A11794	
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Site Description: GPS # 1 : GM-MJ NS2 11001500 Barren River 31W
 37.01281 N 86.41054 W

East Kentucky Power Mist Netting Data Sheet

2B

Date: 7-24-05 Project: GM - Memphis J.V. 11 County: Warren Quad: Bowling Green NJ
 Location: Private land - Woodhouse Rd 21st (same as 7-21) Anabat #: _____
 Start Time: 9:00pm Start Temp: 91.5° End Time: 2:00am End Temp: 79°
 Weather: Clear hot & HUMID Wind: 0-Swift Personnel: SRB, JNB

Provide sketch of net site on reverse side; include net location and number, water sources, roads, trails, bridges, mines/caves, local landscape features, and vegetative description.

#	Time (EST)	Species	Sex/Repro	Age	Weight (g)	Forearm (mm)	Net/Height (ft)	Band # Type:	Transmitter Frequency
1	9:00	P. sub.	M	YOY	4.0	33	A/65+	A11133	
2	10:00	E. fus.	F/adult	A	22.5	47	E/21+	A11149	
3	10:10	E. fus.	F/adult	A			B/11+		
4	10:10	E. fus.	F/adult	A	1.2	44	B/11+	A11126	
5	11:19	E. fus.	F	YOY	15.5	45	A/37	A11101	
6	11:35	E. fus.	F/adult	A	17.5	45	B/47+	A11129	
7		E. fus.	M	YOY	16.5	46	A/5	A11102	
8	12:30	E. fus.	F/adult	A			B/10	A11101	
9	12:30	P. sub.	M	YOY	5.1	31	E/2	A11130	
10	12:30	E. fus.	F/adult	A	22.5	47	B/21+	A11135	
11	12:30	E. fus.	F/adult	A	17.5	45	B/21+	A11135	
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Site Description:

Same as 7/21

APPENDIX IV. MISTNETTING GUIDELINES

MIST NETTING GUIDELINES FROM INDIANA BAT RECOVERY PLAN

Agency Draft - March 1999

RATIONALE

A typical mist net survey is an attempt to determine presence or probable absence of the species; it does not provide sufficient data to determine population size or structure. Following these guidelines will standardize procedures for mist netting. It will help maximize the potential for capture of Indiana bats at a minimum acceptable level of effort. Although the capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. Netting effort as extensive as outlined below usually is sufficient to capture Indiana bats. However, there have been instances in which additional effort was necessary to detect the presence of the species.

NETTING SEASON

May 15—August 15

These dates define acceptable limits for documenting the presence of summer populations of Indiana bats, especially maternity colonies. Several captures, including adult females and young of the year, indicate that a nursery colony is active in the area. Outside these dates, even when Indiana bats are caught, data should be carefully interpreted: If only a single bat is captured, it may be a transient or migratory individual.

EQUIPMENT

Mist nets - Use the finest, lowest visibility mesh commercially available:

1. In the past, this is 1 ply, 40 denier monofilament—denoted 40/1
2. Currently, monofilament is not available and the finest on the market is 2 ply, 50 denier nylon—denoted 50/2
3. Mesh of approximately 1 1/4 - 1 3/4 in (~38 mm)

Hardware - No specific hardware is required. There are many suitable systems of ropes and/or poles to hold the nets. See NET PLACEMENT below for minimum net heights, habitats, and other netting requirements that affect the choice of hardware. The system of Gardner, et al. (1989) has met the test of time.

NET PLACEMENT Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place the nets approximately perpendicular across the corridor. Nets should fill the corridor from side to side and from stream (or ground) level up to the overhanging canopy. A typical set is seven meters high consisting of three or more nets “stacked” on top one another and up to 20 m wide. (Different width nets may be purchased and used as the situation dictates.)

Agency Draft - March 1999

Occasionally it may be desirable to net where there is no good corridor. Take caution to get the nets up into the canopy. The typical equipment described in the section above may be inadequate for these situations, requiring innovation on the part of the observers.

RECOMMENDED NET SITE SPACING:

Stream corridors—one net site per km of stream.

Non-corridor land tracts—two net sites per square km of forested habitat.

MINIMUM LEVEL OF EFFORT

Netting at each site should consist of:

- At least three net nights (unless bats are caught sooner) (one net set up for one night = one net night)

- A minimum of two net locations at each site (at least 30 m apart, especially in linear habitat such as a stream corridor)

- A minimum of two nights of netting

- Sample Period: begin at sunset; net for at least 5 hr

- Each net should be checked approximately every 20 min

- No disturbance near the nets, other than to check nets and remove bats

WEATHER CONDITIONS

Severe weather adversely affects capture of bats. If Indiana bats are caught during weather extremes, it is probably because they are at the site and active despite inclement weather. On the other hand, if bats are not caught, it may be that there are bats at the site but they may be inactive due to the weather. Negative results combined with any of the following weather conditions throughout all or most of a sampling period are likely to require additional netting:

- Precipitation

- Temperatures below 10°C

- Strong winds (Use good judgment: moving nets are more likely to be detected by bats.)

MOONLIGHT

There is some evidence that small myotis bats avoid brightly lit areas, perhaps as predator avoidance. It is typically best to set nets under the canopy where they are out of the moon light, particularly when the moon is half-full or greater.

APPENDIX V. MIST-NETTING PROPOSAL

July 11, 2005

Mr. Lee Andrews
U.S. Fish and Wildlife Service
Frankfort Field Office
3761 Georgetown Rd.
Frankfort, KY 40601

Dear Lee,

Enclosed is information concerning the Indiana Bat (*Myotis sodalis*) mist-netting survey plan for the following project being considered by East Kentucky Power Cooperative (EKPC):

General Motors – Memphis Junction 161 kV Transmission Line

The project is approximately 10 miles in length and is located in Warren County in western Kentucky (See overview map). The line begins at the East Bowling Green/General Motors Substation northeast of Bowling Green and travels west along the northern edge of the city. It then turns southwest after the third Barren River crossing and extends to just east of Blue Level. At this point, the line travels south and ends at the Memphis Junction Substation, located southwest of Memphis Junction. The majority of the project involves rebuilding an existing line to increase it from 69 kV to 161 kV. A portion of the line, running from the second Barren River crossing to the Jennings Creek crossing, will be new line that parallels an existing line. Another section, extending from Blue Level south to the Memphis Junction Substation, will be new transmission line.

The parallel and rebuild sections of the line will require extensions of the current rights-of-ways (ROWs), with a maximum of 70 additional feet for the parallel section and 30 additional feet (15 on each side) for the rebuild section. The extension of the existing ROWs will require the clearing of some trees and could potentially affect the Indiana bat. Therefore, a mist-netting survey plan is being created to address this issue.

EKPC biologists surveyed the 10 miles of existing powerline ROW and concluded that approximately 2 miles are bordered by wooded areas. EKPC biologists classified the wooded areas into one of three categories: good, marginal, and poor. These categories are described as:

Good – the wooded areas provide adequate foraging habitat, potential roost trees, and are connected to other sections of habitat of the same quality.

Marginal – the wooded areas provide some opportunities for foraging, but the majority of the area has a thick understory. The trees in this designation are fairly young in age with little development of cavities, crevices, and exfoliating bark providing limited roosting opportunities for Indiana bats.

Poor – the wooded areas provide very little opportunity for foraging. The wooded areas have a dense understory, trees are very young, and the area resembles the late stages of old field succession. Potential roost sites are very limited and it is estimated that no potential roost trees occur in this habitat type.

The section of the line with the most wooded area begins west of the Natcher Parkway and extends southwest to KY 432. This section of the line is being rebuilt, but the current ROW is wide enough to accommodate the upgrade. Therefore, this section will not require any additional clearing of trees.

The remaining portion of the line contains less than 1 mile of wooded habitat. Two small, wooded areas contain woods that may provide habitat suitable for the Indiana bat. These areas are marked on the enclosed maps and described below.

- 1) **Barren River crossing (Map 1).** This site has good woods along both sides of the river, with wooded roads running parallel to the river on the north side. We propose one mist-netting site here over the river and along the roads.
- 2) **Jennings Creek crossing (Map 2).** This area contains good woods along the banks of the creek, with a larger area of woods located adjacent to the south side of the creek. One mist-netting site is proposed for this area over the creek.

Please review this proposal for a mist netting survey for the Indiana Bat. After surveying the project area, we feel this proposal is more than adequate to determine the presence/probable absence of this species in the project area. Once the survey has been completed, a detailed report of our results will be submitted to your office for comment. We are also in the process of surveying the project area for other federally threatened and endangered species that may occur there. We are surveying the area for species such as Price's potato-bean, Eggert's sunflower, and gray bats. We will submit the results of these surveys as well with the mist netting report.

I would appreciate your comments on this proposal for mist-netting as soon as possible. If you have any questions concerning this or any of our projects please feel free to contact me at your convenience. Thank you for taking the time to address our concerns.

Sincerely,

Joe Settles
Supervisor
Natural Resources and Environmental Communications